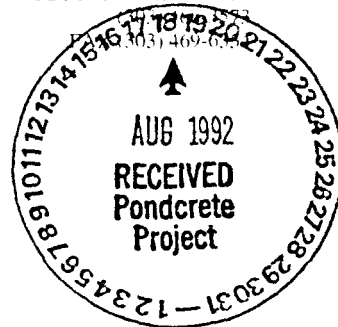


August 11, 1992



Mr. Don Ferrier
Project Manager
EG&G Rocky Flats, Inc.
P. O. Box 464
Room 121A
Golden, Colorado 80402-0464

Subject: Rocky Flats Plant Solar Evaporation Ponds Stabilization Project
[WBS 430 PONDSLUDGE PROCESS TRAIN - EX-SITU CHLORINATION OF B SERIES
POND - HALLIBURTON NUS ROCKY FLATS]
RF-HED-92-0499

Dear Mr. Ferrier:

This letter addresses the issues relating to chlorination of 207 A/B sludges as detailed in the memo between Noreen Matsuura, CDH, and B. Bruninga, EG&G dated 08/06/92.

BACKGROUND

The contents of Pond 207 A are currently being transferred to the B Ponds. Sludge contained in the B Series Ponds will be consolidated into a single pond for process control considerations. During waste processing, the pond contents will be flocculated and dewatered to form a 20% solids cake before mixing with pozzolans, producing stabilized waste form.

NEED FOR CHLORINATION

Chlorination of the pond contents prior to processing is required for the following reasons:

1. Destruction of Pathogens

The ponds may contain pathogens from past disposal practices in which sewage was placed in the ponds. Analysis for typical indicator organisms (Total Coliform and Fecal Coliform) during the Treatability Study did not confirm the presence of large quantities of organisms. However, this may be because the required holding times of these analyses were exceeded because of the transportation time of the samples from Rocky Flats to the HALLIBURTON NUS Laboratory in Pittsburgh, Pennsylvania.

The destruction of pathogens is a criterion for acceptance by NTS of the final stabilized waste form. It would be prudent to assure the destruction of pathogens, if any, by chlorinating the waste before processing.

In addition, chlorination also alleviates the health and safety concerns raised by the processing of a waste with pathogenic elements.

2. Improvement in Handling Characteristics

The physical characteristics of the sludges make their processing inherently more difficult. This is because of the presence of an organic sheath enveloping the sludge particles. The organic sheath is

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composed primarily of the aerobic and anaerobic biomass that have accumulated in the ponds over time. Destruction of this biomass sheath is absolutely essential to alter the gelatinous characteristics of the sludge. This would enable improved settling and allow the decant water to have a lower Total Suspended Solid (TSS). It has been shown by testing done at the HALLIBURTON NUS laboratories that chlorination changes the gelatinous nature of the sludge and produces particles that have mineral characteristics.

CHLORINATION STRATEGIES AVAILABLE

Two methods are available for chlorine addition to the Ponds. The in-situ method of addition consists of slurring the Calcium Hypochlorite crystals in B Pond water withdrawn from the Pond and injecting the slurry beneath the water level to mix the contents of the Pond. All three B Series Ponds will be chlorinated prior to commencing consolidation and homogenization operations.

The ex-situ process would consist of emptying the B South Pond contents prior to starting the chlorination program. All of the contents of the B Series Pond will be pumped through a contact chamber prior to depositing the contents into the South Pond. Water will be decanted back to the remaining two B Series Pond prior to reclaiming the materials for the cementing operation.

The ex-situ chlorination operation is preferred due to the following considerations:

1. Hazards Associated With Chlorine Emissions

In-situ chlorination of the ponds would result in uncontrollable emissions of gaseous chlorine into the atmosphere around the ponds. Chlorine is a deadly, poisonous gas that has very toxic effects on human skin and lungs. This would necessitate the use of personal protective equipment for all personnel in the pond area, which would hamper overall operations. In addition, the effect of wind-blown toxic fumes on the rest of the site could be severe.

Ex-situ chlorination in a contact chamber involving the use of an enclosed tank which is vented would eliminate the health and safety concerns that exist with the in-situ option.

2. Quality Assurance/Quality Control

Use of a contact chamber would allow for thorough mixing of the pond contents with the chlorinating agent. However, when exercising the in-situ option, it would be difficult if not impossible to demonstrate that the entire pond sludge contents had come into contact with the chlorinating agent. The use of a contact chamber would allow the mixing of the pond contents and the chlorinating agent, to be readily monitored and documented during processing.

PROPOSED METHOD OF CHLORINATION

An ex-situ process where the pond contents are mixed with a chlorinating agent in a contact chamber is the recommended mode of chlorination. The raw waste will be chlorinated with Calcium Hypochlorite at a dosage of 2000 ppm available chlorine. This dosage of Calcium Hypochlorite will provide an excess of 1 ppm of residual chlorine after 30 minutes of contact time. This is a common wastewater treatment standard and will be achieved with an engineered structure which provides a minimum residence time of 30 minutes.

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The chlorination chamber is a 12,000 gallon tank into which the pond contents will be pumped. The chlorine will be provided by a premixed 10% (by weight) solution of Calcium Hypochlorite and Pond B water. The 10% Calcium Hypochlorite solution will be metered such that the resulting mixture will have an available chlorine concentration of 2000 ppm by mass. Since the pumping rate from the ponds is expected to range from 10 gpm to 200 gpm, the hydraulic residence times in the tank can range from 1 hour to 20 hours, in both cases exceeding the minimum recommended residence time of 30 minutes. At this stage, the wastes can be considered pathogen free and ready for processing.

The strategy and equipment proposed here is similar to that proposed and approved for Pond 207C chlorination. This approach is in the opinion of Halliburton NUS the most effective method to achieve the processing needs of the project.

Sincerely,

HALLIBURTON NUS ENVIRONMENTAL
CORPORATION



Ted A. Bittner
Project Manager

TAB/jg

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